

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
15 February 2001 (15.02.2001)

PCT

(10) International Publication Number  
WO 01/10339 A2

- (51) International Patent Classification: A61F (74) Agent: MINNICH, Richard, J.; Fay, Sharpe, Fagan, Minnich & McKee, LLP, 7th Floor, 1100 Superior Avenue, Cleveland, OH 44114-2518 (US).
- (21) International Application Number: PCT/US00/22053
- (22) International Filing Date: 11 August 2000 (11.08.2000) (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/148,275 11 August 1999 (11.08.1999) US  
60/148,277 11 August 1999 (11.08.1999) US  
60/148,393 11 August 1999 (11.08.1999) US
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- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

## Published:

— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR PRODUCING AN IMPLANT

(57) Abstract: A method for determining a shape of a medical device to be implanted into a subject produces an image including a defective portion and a non-defective portion of a surface of a tissue of interest included in the subject. The tissue of interest is segmented within the image. A template, representing a normative shape of an external anatomical surface of the tissue of interest, is superimposed to span the defective portion. An external shape of an implant, is determined as a function of respective shapes of the defective portion as seen in the template, for repairing the defective portion. An automated neural-net based 3D surface segmentation, automatic template fitting, and representation of the surface as a series of B-spline space curves save time and computational expenses over previous methods. A fit template homology maps the surface to be mirrored or matched to normative data (e.g., an average homology matched surface) to specify the shape of a defect filling implant. The B-spline space curve representation of the surface allows for serial or parallel registration or averaging of sets of space curves.